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BOOK REVIEW

# Darrell Duffie: How big banks fail and what to do about it

## Princeton University Press, 2010, 112 pages, approx. 30 USD, ISBN: 0691148856

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When I was asked to write a book review of Darrel Duffie's book *How big banks fail and what to do about it*, I accepted with great pleasure. Darrel Duffie, Dean Witter Distinguished Professor of Finance at the Graduate School of Business, Stanford University, is one of the leading scholars in financial economics and has written numerous brilliant research articles and books on financial markets and institutions. *How big banks fail and what to do about it* is no exception as it neatly explains the key underlying mechanisms that can cause large financial institutions to fail. The main theme of the book is that short-term repo funding, prime brokerage, and OTC derivatives are prone to runs similar to classic bank runs on demand deposits. Therefore, these contracts entail significant systemic risk, as became obvious during the 2007–2009 financial crisis. As the title suggests, the book not only describes failure mechanisms, but concludes by proposing various revisions to regulation and market infrastructure to overcome the vulnerability of dealer banks and to strengthen the resilience of the financial system in the United States. Darrel Duffie describes complicated concepts in an accessible way and the book is thus not only interesting for academics and regulators, but also for practitioners and investors who would like to know more about the "plumbing" of the financial system.

The book, which is an extended version of the research article "The failure mechanics of dealer banks" (Duffie 2010), is organized in five chapters. The introduction tells the story of a hypothetical bank that needs to declare bankruptcy after it runs out of liquidity, resembling the demise of Bear Stearns in March 2008. After an initial weakening of its capital position, the bank bails out clients, takes positions in liquidity draining derivative positions, and allows brokerage clients to leave to maintain the

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bank's reputation and to signal strength. The bank runs out of cash when short-term creditors stop providing financing and the bank loses its cash settlement privileges at its clearing bank. This story nicely visualizes the institutional mechanisms and economic principles of failure that are discussed in more detail in the remainder of the book.

Chapter 2 defines large dealer banks and describes their operations. Activities of these large financial institutions at the heart of the financial system include securities dealing, underwriting and trading, OTC derivatives, prime brokerage, asset management, and off-balance sheet financing. These activities play a crucial role in the banks' failure mechanisms that are described in the subsequent chapters. Chapter 2 also includes helpful descriptions of repo financing and credit defaults swap markets that set the stage for the regulatory measures proposed in the final part of the book.

The main part of the book starts in Chapter 3, which discusses how runs on a dealer bank can occur. The first mechanism involves OTC counterparties' reduction of exposure as reaction to a perceived solvency crisis of a dealer bank. Measures such as borrowing from the dealer, entering new offsetting derivative contracts, restriking options at the money, and requesting novation all deplete cash from the dealer bank, aggravating a potential liquidity crisis.

The second mechanism is the flight of short-term creditors in the overnight repo market. If a dealer bank is in trouble, counterparties raise haircuts or reduce the range of eligible collateral, reducing the dealer's funding liquidity, which can force the dealer to fire-sell securities and trigger a liquidity spiral, as discussed by Brunnermeier and Pedersen (2009). In line with Gorton and Metrick (2012), the book argues that cash providers such as money market funds (MMF) ran from the repo market during the financial crisis, which resulted in significantly increased haircuts. However, a recent paper by Krishnamurthy et al. (2012) documents that the contraction in repo was a credit crunch among dealer banks rather than a run by repo cash providers. The authors find that there were significant cross-sectional differences in repo haircuts for different dealers and that the growth and subsequent reduction in MMF-to-dealer repo funding activity was small compared, for instance, to the run on the asset-backed commercial paper market (Covitz et al. 2013). Thus, the increased haircuts in Table 3.2 of the book are more likely to be the result of cautionary liquidity hoarding by systemically important dealers that had trouble financing their assets with repos rather than a run by cash providers.

The third mechanism is the disappearance of prime-brokerage clients. Under certain conditions, large dealers can rehypothecate clients' collateral for margin loans to obtain financing for their own purposes. If clients suddenly withdraw cash, the prime broker loses this financing for its own positions, which again worsens the dealer bank's liquidity position.

The final mechanism leading to the bankruptcy of a dealer bank is the loss of clearing and settlement privileges. During normal times, a clearing bank extends daylight overdraft rights to the dealer bank, that is, the clearing bank processes transactions even if this could bring the clearing account below zero during the business day under the assumption that the dealer will receive cash in subsequent transactions later that day. If the clearing bank fears that the dealer bank is in trouble, it can revoke these overdraft privileges, resulting in the dealer bank not being able to meet its obligations.

The question arises as to why dealer banks that are weakened due to the failure mechanisms discussed in Chapter 3 do not counteract the draining of liquidity by early recapitalization. This is the topic of Chapter 4, which discusses incentives against recapitalization and explores two automatic recapitalization mechanisms that could help replenish funding liquidity. Issuing new equity is impeded by the well-known debt overhang and adverse selection problem. Moreover, equity holders have no incentive to sell assets to raise cash because this would lower the institution's leverage and upside potential. Recapitalization by voluntary debt restructuring is difficult to coordinate and involves a prisoner's dilemma. To overcome these incentives against recapitalization, the book presents distress-contingent convertible debt and mandatory rights offerings of equity as mechanisms to automatically recapitalize weakened financial institutions prior to their failure. These measures are promising, but a successful implementation also faces significant hurdles—foremost among them the definition of an appropriate trigger mechanism.

Acknowledging that automatic recapitalization may not be sufficient and timely in all cases, Chapter 5 proposes further policies to strengthen financial system architecture to reduce the likelihood that a large dealer bank becomes distressed. Namely, Darrel Duffie focuses on stronger liquidity requirements, improvements to the clearing of OTC derivatives and tri-party repos, and improved resolution of failed financial institutions.

Although the book was published in 2010, its conclusions are still highly relevant today. The vulnerabilities of the financial system have not yet been resolved completely by regulators and funding problems for banks, particularly in peripheral European economies, are still acute. In the United States there has been little progress in reforming the tri-party market infrastructure. Moreover, the resolution of large systemically important financial institutions is still an open issue and it is unlikely that a large dealer bank could go bankrupt without causing large disruptions in financial markets. On the positive side, the new Basel III guidelines (liquidity coverage ratio and net stable funding ratio) help avoid liquidity crises by ensuring sufficient long-term funding and less reliance on short-term repos. Moreover, a number of banks have issued contingent convertibles as a means of automatic recapitalization in times of crisis. Finally, central clearing for standardized derivatives has become a key element in new regulation such as the Dodd-Frank Act.

One aspect that I sometimes wished for while reading the book is an international perspective. The analysis of the market infrastructure and the focus on dealer banks is rather U.S. focused. For instance, the European repo market has other characteristics and a different structure than the U.S. market, for example, tri-party repos constitute a much smaller fraction of the market. In my opinion, it would have been interesting to compare different systems around the globe to see to what extent the same or other failure mechanisms exist in international markets. Such a comparison could potentially facilitate the identification of best practices and the most robust market infrastructure for avoiding bank failures in the future. Related to the proposed improvements of regulation, in particular the resolution of large financial institutions is typically a cross-border problem, so I would have been interested to learn the author's suggestions on how to deal with the insolvency of a large bank operating internationally in various jurisdictions.

Overall, I highly recommend the book. I believe the text should be standard reading for anybody involved with regulating and supervising financial institutions as it offers valuable insights into the plumbing of financial markets and the mechanisms that can cause bank failures. The discussed mechanisms are thought provoking and can provide researchers and regulators with valuable ideas for future research on the financial system as well as banking regulation.

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